

Patent Claims

1. Method of handling a person, such as lifting or moving the person from a first position to another, e.g. from a bed or a chair, with a handling system including support means with at least two support sheets initially positioned under the person, said method comprising the following steps:
 - 5 winding said at least two support sheets on at least four rollers to a position in proximity of the person's body,
 - 10 connecting said at least four rollers to handling means, and
 - 15 handling the person by performing a lift or movement in said support means by said handling means.
2. Method of handling a person according to claim 1 characterised in that said connecting includes a locking or fixing process of said at least four rollers to one or more frames and connecting said handling means to one or more of said frames.
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3. Method of handling a person according to claim 2 characterised in that the handling of said one or more frames being performed by drive means, such as electric or pneumatic motors e.g. of a lift actuator, connected to said one or more frames through lifting lines and a lift yoke.
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4. Method of handling a person according to any of claims 1 to 3 characterised in that the handling is performed with rear and front lifting lines connected to the yoke and extremity points of said one or more frames.
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5. Method of handling a person according to any of claims 1 or 4 characterised in that said handling is performed as a

vertical up or down movement or a horizontal movement e.g. of said lift yoke by said handling means.

6. Method of handling a person according to any of claims 1 to 5
5 characterised in that said at least four rollers being pivotally movable by handles or motor means.
7. Method of handling a person according to claim 6 characterised in that said pivotal movement is only possible in one direction during the
10 winding of said at least two support sheets on said at least four rollers.
8. Method of handling a person according to any of claims 1 to 7 characterised in that said one or more support sheets, in a non-use situation, are suspended and stretched out on the mattress of the bed.
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9. Method of handling a person according to claim 8 characterised in that said sheets are suspended by releasable straps or by said at least four rollers connected to holding means, said straps or said holding means being fixed to the sides of e.g. a bed.
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10. Method of handling a person according to any of the claims 1 to 9 characterised in that said at least two support sheets include an upper support sheet and a lower support sheet, being positioned under the upper and/or lower part of the person's body, respectively, e.g. under the back
25 and head and under the seat or thighs of the person.
11. Method of handling a person according to claim 10 characterised in that handling is performed with only said upper support sheet and corresponding frame.
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12. Method of handling a person according to any of claims 1 to 10 characterised in that said handling movement is transferred

to said at least two support sheets resulting in a movement of the person from a laying position to a position supported by said support sheets or vice versa.

13. Method of handling a person according to any of the claims 1 to 12
5 characterised in that said support means are adapted to the size of the body in the area of the support sheets e.g. by changing the width of the frames.

14. Method of handling a person according to any of the claims 1 to 13
10 characterised in that the mutual distance between said at least two support sheets are controlled and/or upheld.

15. Method of handling a person according to any of the claims 1 to 14
15 characterised in that said at least two support sheets are moved sideways underneath the person by dragging at one edge of each sheet and releasing at the other edge of each sheet.

16. Handling system for lifting or moving a person (2) from a first position to another, e.g. from a bed or a chair, said system comprising
20 support means, and

handling means such as a lift or similar lifting means,

25 characterised in that

said support means (59) includes at least two support sheets (3, 6) in contact with different areas of the person's body during handling,

30 said support means (59) further comprises at least four rollers (10, 49-52, 54a, 56a) for winding said at least two support sheets (3, 6) from opposite sides of the

sheet to a position in close proximity of the person's body, said at least four rollers (10, 49-52, 54a, 56a), and

5 said support means (59) being connected to said handling means (22, 23) through said rollers (10, 49-52, 54a, 56a),

wherein said support means (59) establishes a handling structure around the person allowing the person to be lifted or moved by activating said handling means.

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17. Handling system according to claim 16 *characterised in that* said at least two support sheets include an upper support sheet (3) and a lower support sheet (6), positioned under the upper and/or lower part of the person's body, respectively, e.g. under the back and head and under the seat or thighs of the person.

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18. Handling system according to claim 16 or 17 *characterised in that* said support means further comprises one or more frames sections such as a lifting frame (11) or a first frame section (54) connected to said upper support sheet (3) through said at least two rollers (10, 51, 52, 54a) and/or a support frame (17) or a second frame section (56) connected to the lower support sheet (6) through at least two rollers (49, 50, 56a).

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19. Handling system according to any of claims 16 to 18 *characterised in that* said lifting (11) and support frame (17) each includes a first and second frame part (19, 20, 26, 27) connected by at least one flexible intersection (21, 28).

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20. Handling system according to any of claims 16 to 19 *characterised in that* said lifting (11) and support frames (17) are connected by one or more straps (18) e.g. straps from said lifting frame (11) to each of said first and second frame part (19, 20).

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21. Handling system according to any of claims 16 to 20 characterised in that said upper and lower support sheets (3, 6) includes at least one flexible connection such as a number of straps (47, 48) connecting opposite edges of the sheets.
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22. Handling system according to any of claims 16 to 21 characterised in that said first and second frame section (54, 56) includes at least one connection (62), allowing said frame sections to perform a rotating movement in relation to each other.
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23. Handling system according to any of claims 16 to 22 characterised in that said handling means (22, 23) comprises drive means, such as electric or pneumatic motors e.g. of a lift actuator, connected to said one or more frames sections through lifting lines (13, 14) and a lift yoke (12, 58).
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24. Handling system according to any of claims 16 to 23 characterised in that said first position is a bed (1) including said at least two support sheets (3, 6) and at least two holding devices (4, 5, 7, 64) for said at least four rollers (10) or said at least two sheets (3, 6).
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25. Handling system according to claim 24 characterised in that said another position is a chair or similar means used in a sitting position.
26. Handling system according to any of claims 16 to 25 characterised in that said at least two holding devices such as straps (64) are fixed on the sides e.g. of a bed (1).
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27. Handling system according to any of claims 16 to 25 characterised in that at least two holding devices (4, 5, 7) is positioned on one or more movable guide rails (45, 46) e.g. on the sides of a bed (1).
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28. Handling system according to claim 27 characterised in that said guide rails (45, 46) comprises drive means, such as electric motors, connected to said at least four rollers (10, 49 to 52) allowing the rollers to rotate clockwise or anticlockwise to wind or unwind the upper and lower support sheets (3, 6) from the rollers.

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29. Handling system according to any of claims 16 to 28 characterised in that said support means includes a number of different types of lower support sheets (6) such as wider sheets for lifting and rotating a person, normal sheets for lifting the person e.g. approx. 30 centimetres in width and smaller sheets for lifting the person to the bath room, and a number of different types of upper support sheets (3) e.g. approx. 70 centimetres in width.

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30. Handling system according to any of claims 16 to 29 characterised in that said support means includes a number of different types of upper and lower support sheets (3, 6) with different lengths such as approx. 130 centimetres for lifting a person and approx. 260 to 325 centimetres for rotating a person.

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20 31. Handling system according to any of claims 16 to 30 characterised in that said upper and lower support sheets (3, 6) comprise connection sections such as Velcro straps (65) at the longitudinal sheet edges.

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32. Handling system according to any of claims 16 to 31 characterised in that said at least four rollers (54a, 56a) comprise connection sections such as Velcro straps on the roller surfaces.

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33. Handling system according to any of claims 16 to 32 characterised in that said connection sections of said upper and lower support sheets (3, 6) and at least four rollers (54a, 56a) establish connections between said upper and lower support sheets (3, 6) and said at least four rollers (54a, 56a).

34. Handling system according to any of claims 16 to 33 *characterised in that* said at least four rollers (10, 49-52, 54a, 56a) are connected to handles (55, 63) through gear means e.g. with toothed wheels allowing a transmission.

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35. Handling system according to claim 34 *characterised in that* said gear means include at least one spring operated locking pin (67) and at least one ratchet wheel allowing pivotal movement in only one direction during the winding of, said at least two support sheets (3, 6) on said at least four rollers (10, 49-52, 54a, 56a).

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36. Handling system according to any of claims 16 to 35 *characterised in that* said lifting frame (11) or said first frame section (54) comprise triangular or similarly shaped frame parts (12, 54b) with ends connected to two (54a) of said at least four rollers (10, 51, 52, 54a, 56a).

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37. Handling system according to any of claims 16 to 36 *characterised in that* two (56a) of said at least four rollers (10, 51, 52, 54a, 56a) are connected between ends at said pivot hinge (62) and at a boom (56b) as a frame part.

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38. Handling system according to claim 36 or 37 *characterised in that* said rollers (54a, 56a) are connected through poles fixed to said frame parts (54b, 56b), said rollers (54a, 56a) rotating on said poles with bearing means.

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39. Handling system according to any of claims 16 to 38 *characterised in that* the support means comprises rear and front lifting lines (13, 14) connected to the yoke (58) and extremity points of said one or more frame sections (54, 56).

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40. Handling system according to any of claims 16 to 39 *characterised in that* said support means comprises adjustment means (21, 28) to adapt

the size of the means to the body of the person in the area of the support sheets
e.g. by changing the width of the frames.